WHAT IS CLAIMED IS:

1. A method for generating thrust from a gas turbine engine using a pulse detonation system, said method comprising:

introducing fuel and air to the engine;

mixing fuel and air in a pulse detonation system deflagration chamber positioned radially outward from an engine exhaust centerbody; and

detonating the fuel and air mixture within the pulse detonation system to facilitate increasing the temperature and pressure within the engine and to generate engine thrust.

2. A method in accordance with Claim 1 wherein the engine includes a core engine, mixing fuel and air in a pulse detonation system deflagration chamber further comprises:

supplying fuel and air to the deflagration chamber downstream from the core engine such that the chamber is operated in a fuel-rich mode; and

accelerating the fuel-air mixture from the deflagration chamber to a detonation chamber downstream from the deflagration chamber.

3. A method in accordance with Claim 2 wherein accelerating the fuel-air mixture further comprises translating a reverse flap that is downstream from the detonation chamber from a first position during a first mode of engine operation to a second position during a second mode of engine operation.

4. A method in accordance with Claim 1 wherein the engine includes a core engine, mixing fuel and air in a pulse detonation system deflagration chamber further comprises mixing fuel and air in a pulse detonation system deflagration chamber that extends circumferentially around the exhaust centerbody.

5. A method in accordance with Claim 1 further comprising:

positioning the centerbody in a first position during a first mode of engine operation; and

translating the centerbody axially upstream to a second position during a second mode of engine operation.

6. A pulse detonation system for a gas turbine engine, said pulse detonation system configured to create a temperature rise and a pressure rise within the gas turbine engine and to increase gas turbine engine thrust, said pulse detonation system comprising at least one deflagration chamber radially outward from an engine exhaust centerbody.

7. A pulse detonation system in accordance with Claim 6 wherein said pulse detonation system is downstream from a core engine powering the gas turbine engine.

8. A pulse detonation system in accordance with Claim 7 further comprising a detonation chamber in flow communication with said deflagration chamber, said detonation chamber configured to detonate a fuel mixture.

9. A pulse detonation system in accordance with Claim 8 wherein said detonation chamber downstream from said deflagration chamber.

10. A pulse detonation system in accordance with Claim 8 further comprising a reversed flap configured to translate axially from a first position during a first engine operating mode to a second position during a second engine operating mode.

11. A pulse detonation system in accordance with Claim 8 wherein said detonation chamber is semi-toroidal.

12. A pulse detonation system in accordance with Claim 6 wherein said deflagration chamber is annular and extends circumferentially around the engine exhaust centerbody.

13. A pulse detonation system in accordance with Claim 6 wherein said at least one deflagration chamber comprises a plurality of deflagration chambers spaced circumferentially around the engine exhaust centerbody.

14. A gas turbine engine comprising:

an inlet portion;

an exhaust portion positioned co-axially with said inlet portion;

a centerline axis of symmetry;

an exhaust centerbody concentrically aligned with said exhaust portion and extending axially along said centerline axis of symmetry into said exhaust portion; and

a pulse detonation system positioned between said turbofan inlet portion and said turbofan exhaust portion, said pulse detonation system configured to create a temperature rise and a pressure rise within said turbofan engine and to increase turbofan engine thrust, said pulse detonation system comprising at least one deflagration chamber radially outward from said engine exhaust centerbody.

15. A gas turbine engine in accordance with Claim 14 further comprising a core engine configured to power said engine, said centerbody extending downstream from said core engine, said pulse detonation downstream from and in flow communication with said core engine.

16. A gas turbine engine in accordance with Claim 15 wherein said at least one pulse detonation system deflagration chamber is annular and extends circumferentially around said engine centerbody.

17. A gas turbine engine in accordance with Claim 15 wherein said at least one pulse detonation system deflagration chamber comprises a plurality of deflagration chambers spaced circumferentially around said engine centerbody.

18. A gas turbine engine in accordance with Claim 15 wherein said centerbody configured to translate axially from a first position during a first mode of engine operation, and a second position during a second mode of operation.

19. A gas turbine engine in accordance with Claim 15 wherein said pulse detonation system further comprises a detonation chamber downstream from and in flow communication with said at least one deflagration chamber, said detonation chamber is semi-toroidal and is configured to detonate a fuel-air mixture.

20. A gas turbine engine in accordance with Claim 19 wherein said pulse detonation system further comprises a reversed flap configured to translate

axially from a first position during a first engine operating mode to a second position during a second engine operating mode.